

GEOGRAPHIC DISTRIBUTION AND CHECKLIST OF THE BUTTERFLIES OF KERN COUNTY, CALIFORNIA

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ABSTRACT. A checklist of the 126 species of butterflies which are known to occur in Kern County, California is presented. Also considered is information concerning the distribution and flight periods for each species found regularly within the county boundaries. Briefly discussed are the natural features and geography of the area, considering some of its characteristic plant life and climatic conditions.

Butterflies and Kern County Geography

Kern County is located in south-central California and embraces 8064 square miles of very diversified territory, which includes the southern San Joaquin Valley, several mountain ranges and an arid portion of the Mojave Desert. Elevations range from 91 m (300 ft) above sea level at Lost Hills on the Valley floor to 2692 m (8831 ft) on the summit of Mt. Pinos (actually located on the Kern-Ventura County line), and 2583 m (8475 ft) on Owens Peak in the southern Sierra Nevada.

The diversity in elevation, habitats and plant life support an unusually large and varied butterfly fauna for an area the size of Kern County. At present, 126 species and a number of additional subspecies of butterflies have been collected within the county boundaries. Most of these are "residents" or regular visitors which establish transient populations most years. A few are accidental to the region and occur here only as rare strays or migrants from adjacent areas where they are better established. These special cases will be discussed in the checklist portion of this paper.

Kern County can be divided into three general areas geographically. Each area supports its own plant and animal life, including the butterflies.

(1) San Joaquin Valley: An arid lowland valley which is heavily used for agricultural purposes. *Citrus* and alfalfa (*Medicago sativa* L.) are among the predominate crops grown in the region, which are important to numerous kinds of butterflies. Rainfall is about 0.127 m (5 inches) per year, which is not enough to support much natural plant growth. What plants do grow here are adapted to low annual rainfall and very long, hot and dry summers.

Most butterflies occurring in this region are species which are common and widespread in the western United States. These butterflies readily adapt to man's presence and influence and will be found in cities, residential areas, gardens, parks, and in agricultural fields. A

few other butterflies favor riparian habitats along the Kern River or Poso Creek. The Kern River drains the southern Sierra, including Mt. Whitney, and flows throughout the year (until it reaches Bakersfield and is diverted into irrigation canals and urban use) providing water for agricultural and urban development. Bakersfield with an unofficial population of some 250,000 is the largest city in the county and a number of smaller cities and towns lie nearby.

Some of the species occurring on the Valley floor are butterflies which more normally would be expected out on arid stretches of the Mojave Desert. Among these are *Pholisora libya*, *Pontia beckerii*, *Anthocharis cethura morrisoni* and *Danaus gilippus strigosus*. These fly in undisturbed areas away from cities and agricultural fields and can be found in *Atriplex* wastelands, on alkali flats, in ravines or in swampy areas still found in otherwise dry arid country. Others like *Pyrgus scriptura* occur along irrigation ditches or roadsides.

(2) Western Mojave Desert: The portion which lies in Kern County receives less than 0.254 m (10 inches) of rainfall in most years. As is true throughout the county, precipitation is strongly seasonal with most rainfall occurring in the winter and spring months.

Vegetation is generally very sparse. What few plants grow in this area are adapted to highly arid conditions, high summer temperatures and sandy soils. Some common plants of the region are creosote bush (*Larrea divaricata* Cav.), several varieties of rabbitbrush (*Chrysothamnus* spp.), saltbrush (*Atriplex* spp.), buckwheats (*Eriogonum* spp.), Joshua tree (*Yucca brevifolia* Engelm. in Wats.) and several varieties of cacti. Various kinds of wildflowers can be found during the spring months.

Most of the Kern County desert is flat and unremarkable, and few species of butterflies can be expected. Much better conditions exist where the desert and mountain regions meet. A great many desert butterflies occur on the arid east slope of the Sierra Nevada, in adjacent canyons or in the high desert valleys. Walker Pass, elevation 1600 m (5250 ft), in the southern Sierra is a particularly well known locality often visited by lepidopterists. Other lucrative areas for collectors are Red Rock Canyon, Jawbone Canyon and Kelso Valley. At least 70 species of butterflies have been recorded from the Kelso Valley region alone, which makes this area exceptionally interesting. Several species more commonly encountered in the mountains can be found commonly in desert washes out of their usual habitat. Most "desert" species of the region fly during the spring months of April and May, but a few species can be found through the summer and fall months as well.

Two "rare" desert species with very sporadic distributions in southern or southeastern California are *Pseudocopaodes eunus* and *Ple-*

bulina emigdionis. Both of these butterflies are locally common around Weldon, located along the south fork of the Kern River near Lake Isabella and on the northern edge of Kelso Valley.

Still, the Kern County desert lacks the rich desert fauna of other deserts located to the south and east. Several "desert" species common in Arizona or in southeastern California are encountered in this region only as rare strays or as small transient populations in years of favorable rainfall.

(3) Montane areas: Mountains ring the San Joaquin Valley on three sides. These include the arid Temblor Range (part of the Coast Range) to the west; the Transverse Ranges (including Frazier Park and Mt. Pinos) to the south; the Tehachapi Mountains to the southeast; and the southern Sierra Nevada, Greenhorn and Piute mountain ranges to the east and southward. The Greenhorn and Piute ranges are actually subranges of the Sierra, but are best considered separately, because each of these three areas differ considerably ecologically and in butterfly fauna. Most plants and animals (including the butterflies) of these mountain ranges are characteristic of the Upper Sonoran or Transition Life Zones.

The mountains of Kern County are very rich in butterflies. For example, over 100 butterfly species have been collected within a radius of 15 miles from the town of Lake Isabella, which is adjacent to the southern Sierra, Greenhorn and Piute mountain ranges. Butterflies are found in these regions from late February or early March well into October or even November in some years.

In the mountains grow several different species of conifers, including incense cedar (*Calocedrus decurrens* (Torr.)), ponderosa pine (*Pinus ponderosa* Lawson), Jeffrey pine (*Pinus jeffreyi* Grev. & Balf., in A. Murr.), sugar pine (*Pinus lambertiana* Dougl.), some lodgepole pine (*Pinus contorta murrayana* Grev. & Balf.), digger pine (*Pinus sabiniana* Dougl.), white fir (*Abies concolor* (Gord. & Glend.)), red fir (*Abies magnifica* Murr.) and California juniper (*Juniperus californica* Carr.). Along streams or in the mountain canyons are found white alder (*Alnus rhombifolia* Nutt.), sycamore (*Platanus racemosa* Nutt.), cottonwoods (*Populus* spp.) and several kinds of willows (*Salix* spp.). A number of species of oaks (*Quercus*) and buckwheats (*Eriogonum*) grow on the drier slopes. Many varieties of annual wildflowers and grasses are also found in these several mountain ranges.

The Transverse Ranges are represented in Kern County by the Tejon Mountains and are actually part of the Coast Range. Mt. Pinos and Frazier Mountain (the summit of which is actually in adjacent Ventura County) are both well over 2440 m (8000+ ft) elevation and are rich in butterflies. A number of species with very limited distribution (i.e.,

Colias harfordii, *Chalceria heteronea clara*, *Icaricia neurona* and *Speyeria coronis hennei*) occur in this region.

The Tehachapi Mountains rise to an elevation of 2435 m (7988 ft) on the summit of Double Mountain above Tehachapi Mountain Park near the town of Tehachapi. A trail leads to this mountain summit where is found the rare *Speyeria egleis tehachapina* and the somewhat more common *Speyeria coronis hennei*. Only the latter species sometimes descends the lower slopes to the Mountain Park below. The highly sought *Speyeria adiate atossa* once flew with *Speyeria egleis tehachapina* on the mountain summits but could be found descending to much lower elevations in shaded woodlands and along small streams.

The Temblor Range is a low arid range located on the west side of the San Joaquin Valley. There are relatively few species in these foothills but one prized butterfly which does occur here is *Mitoura siva mansfieldi*, a subspecies distinguished by its dark green coloration underneath. Despite an abundance of junipers in these foothills, *mansfieldi* is scarce and hard to find.

The southern Sierra Nevada become very arid south of the Tulare County line. The range (not including the Greenhorns or Piutes because these are being considered separately) continues south to near the edge of the Mojave Desert at Butterbredt Peak (also known as Butterbread Peak), which has an elevation of 1829 m (6000 ft). On these seemingly arid hillsides and hilltops fly the rare *Pholisora alpheus oricus* and the southern Sierra subspecies of *Papilio indra*.

The Kern County Sierra is too arid and low in elevation to support the array of boreal species found further north in the Canadian, Hudsonian and Arctic-Alpine Life Zones of the truly high Sierra. However, several of these high elevation species do occur just 10 to 15 miles north of the county line and may occasionally stray southward to Kern County. Some of these may yet be found on Owens Peak or in adjacent mountain areas accessible only by well marked foot-trails. More study of this region is definitely needed.

The Greenhorn Mountains receive heavy winter snows and are the most heavily wooded mountains in the county. The forested areas are poor butterfly habitats, but favorable places for lepidoptera exist in moist meadows, along roads or in various kinds of disturbed places. For many years this has been the well known habitat of *Speyeria hydaspe viridicornis* and the only known southern California locality for *Clossiana epithore sierra*, as cited in Emmel & Emmel (1973).

The Piute Mountains are located south of the previous mountain range and Lake Isabella and are generally drier than the Greenhorns, yet somewhat surprisingly, are much richer for butterflies in general.

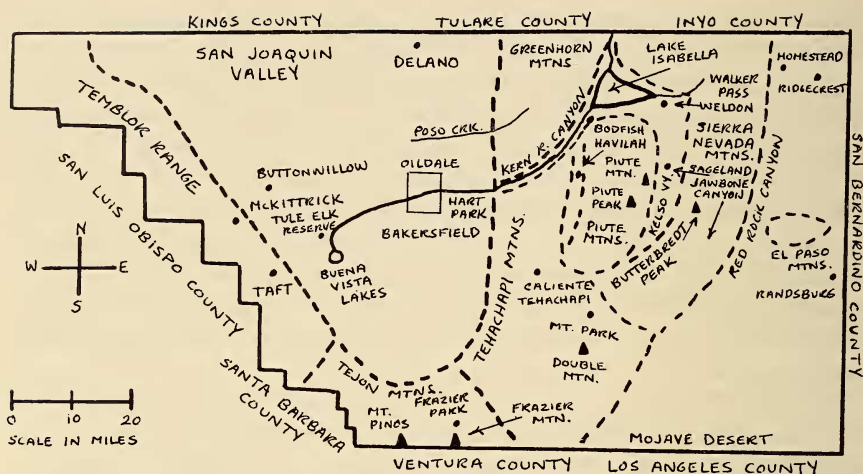


FIG. 1. Map of Kern County, California, showing geographical features and collecting localities.

The highest summits are Piute Mountain at 2538 m (8326 ft) and Piute Peak at an elevation of 2570 m (8432 ft). Lepidopterists visit here rather regularly for *Papilio indra*, *Mitoura siva juniperaria*, *Icaricia neurona*, *Speyeria egleis tehachapina*, the very variable *Thessalia leanira* population of this region, *Occidryas editha editha* and a number of other interesting species.

Our knowledge of the Kern County fauna is incomplete, and questions still remain to be answered. But, it would appear unlikely that many new species remain to be discovered in this area. A few will likely be found in the southern Sierra along the Tulare-Kern County line or in the Greenhorn Mountains. More work remains to be done in compiling distributional data, even on the floor of the San Joaquin Valley where unusual or unexpected species have turned up in recent years.

Sources of Information for the Kern County Checklist

I have actively collected in Kern County for 18 of the past 23 years, while Jim Brock has collected and studied the fauna of the region since 1968. In 1975 the two of us met and undertook the joint project of compiling a county list and defining the distribution of each species. Jim Brock was especially active in eastern Kern County, and his field work provided the basis for much of my own studies in recent years. Today, each of us has extensive collections of Kern County butterflies, which provide much of the basis and documentation for this paper.

During the course of our project an effort has been made to visit poorly collected localities overlooked by others. These include numerous places on the floor of the San Joaquin Valley, the Kern River Valley, Kelso Valley and in the southern Sierra. The result has been a wealth of new information and data to add to that already obtained by other workers who had already contributed heavily to this project.

Emmel & Emmel (op. cit.) treated many of the species found in Kern County in their book on southern California butterflies and a number of scientific papers (too numerous to list) have dealt with some aspect of the region's butterfly fauna.

A number of lepidopterists have contributed data or information used in this paper. These include John Burns, Julian P. Donahue, John F. Emmel, Gary File, Rick Hewett, Weldon Kirk, Robert Langston, John Luttrell, William W. McGuire, Ed Moran, James Mori, Paul Opler, Jerry Powell, Allen Rubbert, Ed Sampson and Charles Sekerman. Past workers who contributed to our present knowledge include John Adams Comstock, Charles M. Dammers and H. Morrison.

Introduction to the Kern County Checklist

The annotated checklist section of this paper considers 126 species for which there are definite records of capture from within the county boundaries. About 10 of these actually represent strays of species not normally found in the region or butterflies of questionable status which may not be a true part of the Kern County fauna.

Following the main checklist is another listing of "doubtful or questionable records," which considers a few additional species having been accredited to Kern County but which are based on questionable data, determinations or evidence.

In listing the butterflies in the checklist, I have *generally* followed the nomenclature and phylogenetic order used in "A Catalogue/Checklist of the Rhopalocera of America North of Mexico" (Lee D. Miller & F. Martin Brown, 1981, Mem. Lepid. Soc. No. 2).

For species found in Kern County on a regular basis, information is presented regarding distribution and normal flight periods. Specific records are cited to add authority to the text and document previously unpublished information but are not given in the case of common species unless in some way significant. The dates given for flight periods are representative of when the butterfly normally occurs (or has been collected) and are not the result of an exhaustive study of the collection data of the various contributors. While earlier and later collection data undoubtedly exist for many of the butterflies considered, the dates given provide a fairly accurate picture of the year-to-

year flights for most species or subspecies. Of course, more data are needed on several of the less commonly encountered butterflies.

Also considered in the text are unusual populations, comments regarding taxonomy, or other information of interest not published or generally well known. An effort has been made not to simply duplicate or restate information already published somewhere else in the literature.

The varied topography of Kern County supports a number of undescribed or atypical populations. Some of these will undoubtedly be described as new subspecies by other lepidopterists in the near future. Any mention or description of these given in this paper is merely intended to show how a specific population differs from other described known populations. These comments are not intended as a formal description of any "new" subspecies. Which of these unusual or atypical populations warrant names or recognition in the nomenclature will be left to the taxonomists and specialists in their respective fields.

To conserve space in the checklist a distribution code is used to represent various general localities where the butterflies can be found. Such a code represents the names of the major valleys, canyons and mountain ranges. The names of cities and towns or the citations of specific locality data will not be coded. The code is as follows:

(1) Code for the major valleys or lowlands:

SJV: The San Joaquin Valley, often including Bakersfield.

KRV: The Kern River Valley, often including Kernville, Lake Isabella and Weldon.

(2) Code for the desert regions:

MD: The Mojave Desert.

RRC: Red Rock Canyon and vicinity.

WP: Walker Pass, often on the dry eastern slope of the Sierra.

JC: Jawbone Canyon, located at the south end of the Sierra.

KV: Kelso Valley, often including Sageland and arid foothills.

(3) Code for the mountain regions:

MTNS: Mountains, distribution general throughout most of the mountain areas of Kern County.

SNM: Sierra Nevada Mountains, including the area along the Kern-Tulare County line southward to Butterbrecht Peak.

GM: Greenhorn Mountains, including Cedar Creek and Mountain Park.

PM: Piute Mountains, including areas adjacent to Bodfish and Havilah; also includes Hooper Hill.

TM: Tehachapi Mountains, includes Tehachapi Mountain Park and the Caliente region.

TJM: Tejon Mountains, including Frazier Park and Mt. Pinos.

TR: Temblor Range, including McKittrick and Taft.

KRC: Kern River Canyon, including Miracle and Democrat Hot Springs and the area around Richbar.

Specific records given in the text are those of the author unless otherwise stated.

AN ANNOTATED CHECKLIST OF THE BUTTERFLIES OF
KERN COUNTY, CALIFORNIA

HESPERIIDAE

1. *Polygonus leo leo* (Gmelin).

Jim Brock collected a single worn specimen of this skipper 5 miles east of Caliente on 6 IX 73. This record probably represents a wind blown stray. It is almost certainly not a regular member of the county fauna.

2. *Thorybes pylades* (Scudder).

Distribution: SNM, GM, TM, TJM. Flight: 13 VI to 23 VI.

Widely distributed but rarely encountered. Most records are from the Frazier Park region where *pylades* probably first appears in May.

3. *Erynnis brizo lacustra* (Wright).

Distribution: GM, PM, TM, TJM. Flight: 3 IV to 30 VI.

4. *Erynnis propertius* (Scudder & Burgess).

Distribution: MTNS. Flight: 11 III to 11 VII.

5. *Erynnis tristis tristis* (Boisduval).

Distribution: KRV, SJV, PM (Hooper Hill). Flight: 25 IV to 24 IX.

Common at Bakersfield in 1962 and 1963, *tristis* has since become exceedingly scarce in the southern San Joaquin Valley.

6. *Erynnis pacuvius* (Lintner).

John Burns examined material of this species from Kern County (in 1980) and determined that two subspecies occur here:

a. *Erynnis pacuvius lilius* (Dyar).

Distribution: GM, PM. Flight: 11 VI to 21 VII.

b. *Erynnis pacuvius callidus* (Grinnell).

Distribution: TM, TJM. Flight: 31 V to 21 VII.

Generally *callidus* is found further south and southwest than *lilius*. Sympatry has not been observed.

7. *Erynnis funeralis* (Scudder & Burgess).

Distribution: SJV, KRV, PM, MD. Flight: 10 IV to 9 X.

Common throughout most of southern California, *funeralis* is rare in Kern County. Like *E. tristis*, this species was common in Bakersfield in 1962 and 1963.

8. *Erynnis persius persius* (Scudder).

The status of this widely distributed *Erynnis* in Kern County is presently unknown. It is included on the county list on the basis of a single specimen collected by Jerry Powell at Delano on 12 VII 55 (Burns, 1964). John Burns (pers. comm.) suspects that *persius* may be "resident" within the county boundaries and is probably much more widely distributed here than the lone record would suggest. It has been collected at Big Meadow in the southern Sierra, Tulare County, which is just a few miles north of the county line.

9. *Pyrgus scriptura* (Boisduval).

Distribution: Western SJV. Flight: 27 II to 3 X.

Most of our records are from Buttonwillow and Lost Hills. *Scriptura* appears to be absent from agricultural areas around Bakersfield and the eastern side of the San Joaquin Valley. Very local.

10. *Pyrgus communis albescens* Plötz.

Distribution: SJV, KRV, KV, MD, MTNS, at lower elevations. Flight: 25 II to 9 XI.

11. *Heliopetes ericetorum* (Boisduval).

Distribution: SJV, KRV, KV, JC, MTNS. Flight: 30 IV to 9 X.

12. *Pholisora catullus* (Fabricius).

Distribution: SJV, KV, PM, east slope of Breckenridge Mountain. Flight: Mountains and desert: 3 IV to 7 VI. SJV: 20 VIII to 5 IX. Probably double brooded in the southern San Joaquin Valley. The mountain and desert populations appear to be single brooded.

Catullus appeared to be absent from the floor of the southern San Joaquin Valley until a small population was found in a swampy area adjacent to the Kern River flood canal on the Tule Elk State Reserve on 20 VIII 81.

13. *Pholisora libya* (Scudder).

Two variable and geographically separated populations occur in Kern County. Out on the Mojave Desert (including Homestead and Jawbone Canyon) and on the east slope of the Sierra Nevada there is a rather mixed population which shows characteristics of nominate *libya* and the larger *lena* (Edwards) but which tends toward *lena* (John F. Emmel, pers. comm.). Individuals of this eastern Kern County population are frequently encountered which have the undersurface of the hind wings entirely colored with white scales.

In the western San Joaquin Valley (Maricopa, Taft, Buttonwillow, McKittrick and Lost Hills) is an undescribed subspecies (Emmel & Emmel, 1973) distinguished by its larger size and washed-out appearance of the underside of the hind wings.

Flight of *P. libyallena*: 6 V to 26 V; 21 VIII to 30 IX.

Flight of SJV subspecies: 28 IV to 18 V; 20 VI to 12 IX. The spring brood of the SJV populations is the heaviest flight; later broods are unreliable and made up of few individuals. This is in contrast with the desert population which has its heaviest flight in the late summer and early fall.

14. *Pholisora alpheus oricus* Edwards.

Distribution: SNM (Butterbredt Peak). One record for KV. Flight: 21 V to 15 VI. Probably appears in late April.

A rare butterfly throughout most of its range, *oricus* is locally abundant on the eastern and southern slopes and canyons of Butterbredt Peak where the *Atriplex* foodplant grows.

15. *Copaeodes aurantiaca* (Hewitson).

Distribution: Homestead, WP, KV, Caliente Canyon. Flight: 1 V to 22 X.

Aurantiaca breeds in small numbers in the desert areas and in low arid mountain canyons. Tom Rubbert collected a specimen in the San Joaquin Valley at Bakersfield on 17 VI 50. Allen Rubbert has a specimen from the same locality which lacks data as to the date of capture.

16. *Hylephila phyleus* (Drury).

Distribution: MD, SJV, KRV, Caliente region. Flight: 8 IV to 12 XII.

17. *Pseudocopaeodes eunus eunus* (Edwards).

Distribution: Weldon, Onyx and probably elsewhere in KRV. Formerly known from SJV where relict populations may still exist. Flight: 14 VI to 21 VIII in KRV.

John Adams Comstock (Comstock, 1927) reported that *eunus* was known from the southern San Joaquin Valley at that time. C. M. Dammers collected at least one female specimen (now in the Los Angeles Museum) at Panama (near Bakersfield) on 18 VIII 29. This population may have disappeared with the destruction of its saltgrass habitat due to urban and agricultural development of the region. At least no recent records for

this species in the San Joaquin Valley are known to the author. However, *eunus* can still be found commonly in saltgrass habitats at Weldon and Onyx where it appears to fly continuously throughout the summer months. Ron Leuschner discovered this population on the Kern River Preserve at Weldon on 13 VI 81.

18. *Hesperia juba* (Scudder).

Distribution: SNM, GM, PM, TM, TJM, WP, KV. Usually uncommon. Flight: 9 V to 20 VI; 11 IX to 14 X. More common in the fall.

19. *Hesperia comma* (Linnaeus).

Two distinct populations occur in Kern County:

a. *Hesperia comma harpalus* (Edwards).

Distribution: KRV, KV, SNM, WP, PM (east slope). Flight: 19 VI to 5 IX.

b. *Hesperia comma near tildeni* Freeman.

Distribution: PM (west slope), KRC, TM, GM, TJM. Flight: 1 VII to 9 X.

This population of *comma* is smaller and lighter than *harpalus*. How this population is actually related to other Sierran and Coast Range populations is presently under study by William W. McGuire. The Sierran subspecies *yosemite* Leussler probably does not occur in Kern County.

20. *Hesperia columbia* (Scudder).

Distribution: Kernville, PM, TJM. Flight: 31 III to 24 V; 12 IX. Ray Stanford collected a specimen on the summit of Mt. Pinos on 29 VI 63, an extreme collection date. Most records are for May.

Columbia is intensely local and uncommon and few records exist for Kern County. It has been collected in numbers at two localities in Ventura County adjacent to the Kern County line. It should be found at several additional localities as more favorable habitat areas are explored in the future.

21. *Hesperia lindseyi* Holland.

Distribution: GM, PM, TM, TJM. Flight: 14 V to 12 VII.

Usually uncommon and local in occurrence.

22. *Polites sabuleti sabuleti* (Boisduval).

Distribution: SJV, KRV, KV, Havilah, TM, TJM. Flight: 4 V to 1 XI. Probably first appears in April.

Individuals which resemble *chusca* (Edwards) are regularly found in most county populations.

23. *Polites sonora sonora* (Scudder).

Distribution: GM, TM. Flight: 13 VI to 11 VII.

24. *Atalopedes campestris campestris* (Boisduval).

Distribution: MD, SJV, KRV, KRC, PM, TM, TJM. Flight: 28 III to 13 XI.

25. *Ochlodes sylvanoides sylvanoides* (Boisduval).

Distribution: MTNS. Flight: I VII to 9 X.

26. *Ochlodes agricola* (Boisduval).

Three subspecies occur in Kern County:

a. *Ochlodes agricola agricola* (Boisduval).

Distribution: TM, TJM. Flight: Late May to early July.

b. *Ochlodes agricola verus* (Edwards).

Distribution: Havilah, PM, KV. Flight: 26 V to 21 VII.

c. *Ochlodes agricola nemorum* (Boisduval).

Distribution: Kernville, SNM, GM. Flight: 19 V to 7 VII.

Nemorum blends with *verus* on the northern edge of the Piute Mountains around Bodfish.

27. *Paratrytone melane melane* (Edwards).

Distribution: KRC along Clear Creek at Miracle Hot Springs. Flight: 14 V to 21 V; 10 VIII.

Widespread elsewhere in southern California, this skipper thus far has been found only at the above mentioned locality where it is uncommon.

28. *Lerodea eufala* (Edwards).

Distribution: MD, SJV, KRV. Flight: 23 III to 12 XII. Most records are from August through October.

MEGATHYMIDAE

29. *Megathymus coloradensis martini* Stallings & Turner.

Distribution: SNM (arid slopes), WP, KV. Flight: 3 IV to 25 V.

This large skipper is rarely taken in numbers but probably has a wider range out on the desert floor where stands of the *Yucca* larval foodplant are rather common.

PAPILIONIDAE

30. *Battus philenor* (Linnaeus).

This is not a regular member of the county fauna and apparently occurs only as a stray. There is only one definite record: 13 miles west of Shafter (a male on alfalfa); 30 VI 57; collected by Paul Opler. Which subspecies this record represents is questionable. Either the nominate subspecies or northern California *hirsuta* (Skinner) could stray into the county at times.

31. *Papilio rudkini* Chermock & Chermock.

Distribution: SNM (Butterbredt Peak), one record for RRC by Jim Brock (5 IV 74). Flight: 5 IV to 26 V.

This desert swallowtail is an uncommon find in Kern County, but there are several records for adults and larvae (on *Tauschia parishii* (C. & R.)) on Butterbredt Peak. (*Thamnosma montana* Torr. & Frem. is the usual host in most of its range.) Many lepidopterists believe that *rudkini* is probably a subspecies of *Papilio polyxenes* Fabricius.

32. *Papilio zelicaon zelicaon* Lucas.

Distribution: SJV, MTNS. Flight: 25 II to 25 X.

33. *Papilio indra phyllisae* J. Emmel.

Distribution: SNM (Butterbredt Peak and vicinity), PM (Piute Mountain Vista; also 1 mile west of Kelso Valley Road Summit at east end of Piute Mountains). Flight: 13 IV to 30 VII. This subspecies has a small second brood which flies during the month of July.

Though presently known from but three localities in the county, *phyllisae* will undoubtedly be found on several of the higher peaks in the southern Sierra Nevada where the *Tauschia parishii* foodplant is widely distributed.

34. *Pterourus rutulus rutulus* (Lucas).

Distribution: SJV, KRV, MTNS. Flight: 8 III to 25 X.

35. *Pterourus multicaudata* (Kirby).

Distribution: GM (Cedar Creek), PM, TM, TJM. Flight: 29 V to 30 VII. Probably appears in early May on east slope of Breckenridge Mountain near Havilah.

Multicaudata tends to be local in occurrence and uncommon but is sometimes locally abundant. It prefers canyon bottoms with small streams where oak woodland and coniferous forest meet.

36. *Pterourus eurymedon* (Lucas).

Distribution: MTNS. Flight: 24 IV to 21 VII.

PIERIDAE

37. *Neophasia menapia menapia* (Felder & Felder).

Distribution: GM, PM, TM. Flight: 9 VII to 20 VIII.

38. *Pontia beckerii* (Edwards).

Distribution: SJV, KRV, MTNS, MD. Flight: 22 III to 3 XI.

One of the surprises of this survey was finding a large population of this butterfly on the floor of the San Joaquin Valley. A few *beckerii* adults had been collected around Bakersfield prior to 1981, but it was assumed that these individuals represented strays from other areas. Actually, *beckerii* appears to be well established in the foothills northeast of Bakersfield (southeast edge of Hart Park, 20 VI 72; 6 to 16 VI 81) and north of Oildale (Poso Creek 8 miles north of Oildale, 18 V to 26 VI 81). It was also abundant along the Glennville-Woody Road 8 to 20 miles north of Oildale on 26 VI 81. The bladderpod plant, *Isomeris arborea* Nutt., grows commonly in this portion of the San Joaquin Valley and is likely used as a larval host.

39. *Pontia sisymbrii sisymbrii* (Boisduval).

Distribution: MTNS, WP, KV, Kernville. Flight: 25 II to 30 V.

40. *Pontia protodice* (Boisduval & LeConte).

Distribution: Entire county. Flight: 12 II to 24 XI.

41. *Artogeia rapae* (Linnaeus).

Distribution: Entire county except arid portions of desert. Flight: All months, but mostly from March through October.

42. *Euchloe hyantis* (Edwards).

Two sets of populations occur in Kern County:

a. *Euchloe hyantis lotta* (Beutenmüller).

Distribution: MD, SNM, PM (east slope), TM (arid southern and eastern slopes). Flight: 12 III to 15 V.

b. *Euchloe hyantis* (Edwards) ssp. "Mt. Pinos block segregate." (Opler, 1968, 1969; also Emmel & Emmel, 1973)

Distribution: TJM. Flight: 5 V to 8 VI.

This population is uncommon and rarely collected in numbers.

43. *Anthocharis cethura morrisoni* Edwards.

Distribution: Western SJV, TR, SNM, PM (Hooper Hill and arid eastern slope), KRC (Miracle Hot Springs), KV, WP, RRC. Flight: 19 II to 15 V. Certain populations (KRC and SJV) have been noted to forego emergence in years of unfavorable rainfall.

This subspecies is distinguished by the dark green coloration of the hind wings. Most females of the lower Kern River and valley populations lack the "orange-tip" though females from eastern Kern County often do.

44. *Anthocharis sara sara* Lucas.

Distribution: KRV, TR, MTNS, KV. Flight: 17 II to 21 VI. The early spring brood (*reakirtii* Edwards) is the most common. The larger and lighter second brood is relatively scarce.

45. *Falcapica lanceolata lanceolata* (Lucas).

Distribution: SNM, GM, PM, TJM, KRC, WP, Erskine Creek near Lake Isabella. Flight: 28 II to 19 VI.

Though generally considered to be a rare species, *lanceolata* is often abundant along Erskine Creek and in the Piute Mountains just south of Bodfish.

46. *Colias eurytheme* Boisduval.

Distribution: Entire county. Flight: 20 II to 5 XI.

This species is often a serious economic pest in the San Joaquin Valley.

47. *Colias harfordii* Hy. Edwards.

Distribution: KV, PM, TM, TJM. Flight: 28 V to 26 VIII. Another flight in late September and October is probable since *harfordii* was observed and collected in numbers on the north slope of Frazier Mountain in Ventura County (just across the county line) on 9 X 81.

Most records for the county are from Frazier Park and Mt. Pinos. Elsewhere, it tends to be very rare and unreliable. The northernmost records for *harfordii* are from the Piute Mountains (near Liebel Peak, 21 VII 78) and Kelso Valley (the area around Sageland) where the butterfly occurs in June.

48. *Zerene eurydice* (Boisduval).

Distribution: TM, TJM. Flight: 23 VI to 11 VII.

Though common in much of southern California, this butterfly is scarce in Kern County. It is uncommon in the Transition Zone of Tehachapi Mountain Park and around Frazier Park. It can sometimes be fairly common on dry hillsides near the McGill Campground on Mt. Pinos. *Eurydice* appears to be single-brooded at these localities though multiple-brooded elsewhere in southern California.

49. *Zerene cesonia cesonia* (Stoll).

This species is uncommonly found in Kern County, but it evidently establishes transient breeding populations out on the desert floor. Many were seen in Jawbone Canyon and on Tom's Hill in April and May of 1978. I know of two definite records: Weldon Kirk collected a specimen at Tehachapi Mountain Park in August of 1962 (specific date unknown); and I have a record for Koehn Dry Lake, 18 IV 78.

50. *Phoebis sennae marcellina* (Cramer).

This is not a regular member of the county fauna, though it may occasionally breed on *Cassia* plants out in the Mojave Desert. Ed Sampson collected a single male near Arvin in the San Joaquin Valley on 10 III 68. It has been collected on Frazier Mountain just south of the county line in Ventura County.

51. *Eurema mexicana* (Boisduval).

This is another species which reaches the area periodically and which may establish transient populations on *Cassia* plants out on the desert floor. There are definite records for Frazier Park, Bodfish, Weldon and Lakeview (in the San Joaquin Valley) where Ed Sampson collected a specimen on 16 V 66. Most of the other records are also for the month of May.

52. *Abaeis nicippe* (Cramer).

Distribution: MD (including Ridgecrest) with other records of strays or transients from north of Kernville, Bodfish, PM, WP, JC and Caliente Canyon. Flight: 6 III to 9 X.

This species may not be permanently established in Kern County and may need to periodically reestablish itself here after cold winters. Records for early March in 1978 indicate that it does successfully overwinter at times.

53. *Nathalis iole* Boisduval.

This is another species which enters the region only occasionally. Records exist for the Mojave Desert, adjacent mountain ranges (PM, TM, TJM) and even the San Joaquin Valley. Most of these records are for May or early June.

LYCAENIDAE

54. *Tharsalea arota arota* (Boisduval).

Distribution: MTNS, KRV. Flight: 20 V to 10 VIII.

55. *Gaeides xanthoides xanthoides* (Boisduval).

Distribution: MTNS, KRV, KV. Flight: 21 V to 4 VIII.

56. *Gaeides gorgon* (Boisduval).

Distribution: MTNS, KV. Flight: 14 V to 19 VI.

57. *Chalceria heteronea clara* (Hy. Edwards).

Distribution: PM, TM, TJM. Flight: 22 VI to 26 VII.

Clara has a very restricted range in southern California where it tends to be scarce and local in occurrence. Many former habitat areas have disappeared because of human influence. It is still common in certain canyons and washes in the Tejon Mountains. Most records are from around Lebec and Frazier Park.

58. *Epidemia helloides* (Boisduval).

Distribution: SJV (rare), KRV, Havilah, KRC, Paris-Lorraine, Frazier Park. Flight: 30 IV to 1 XI.

59. *Habrodais grunus grunus* (Boisduval).

Distribution: MTNS. Flight: 26 VI to 4 IX.

60. *Atlides halesus estesi* Clench.

Distribution: SJV, KRV, TM, TJM, TR. Flight: 10 III to 21 X.

This spectacular butterfly is sometimes abundant in residential areas of Bakersfield, along the Kern River at Hart Park and in the Caliente region. Usually, it is rather scarce.

61. *Satyrrium behrii behrii* (Edwards).

Distribution: KV, PM (east slope), TM, TJM. Flight: 14 VI to 10 VII.

62. *Satyrrium californica* (Edwards).

Distribution: MTNS. Flight: 3 VI to 20 VII.

63. *Satyrrium sylvinus* (Boisduval).

Sierran *S. sylvinus sylvinus* may be the subspecies found in the Greenhorn Mountains. Two other subspecies occur in Kern County:

a. *Satyrrium sylvinus dryope* (Edwards).

Distribution: KRC, TM, TJM. Flight: 1 VI to 4 VIII.

Dryope is usually found at lower elevations than the next subspecies. It is also less common than *desertorum*.

b. *Satyrrium sylvinus desertorum* (Grinnell).

Distribution: KRV, MTNS. Flight: 29 V to 10 VIII.

Sylvinus from Havilah and the Greenhorn Mountains appear darker underneath

than *desertorum* from the Tehachapi Mountains. These need further study before they can be properly placed taxonomically.

64. *Satyrium auretorum spadix* (Hy. Edwards).

Distribution: TR, GM, TM, TJM. Flight: 8 VI to 30 VII.

65. *Satyrium tetra* (Edwards).

Distribution: PM, TM, TJM. Flight: 19 VI to 26 VII.

66. *Satyrium saepium saepium* (Boisduval).

Distribution: MTNS. Flight: 14 V to 26 VII.

67. *Callophrys dumetorum dumetorum* (Boisduval).

Distribution: SNM, PM, KRC, TJM, KV. Flight: 20 II to 22 V.

Many Kern County populations seem atypical and warrant further study.

68. *Mitoura spinetorum* (Hewitson).

Distribution: MTNS. Flight: 30 IV to 17 IX.

This hairstreak is rarely found in numbers. It is sometimes common on flowers or along streams at Tehachapi Mountain Park or in the Caliente region. Gary File has one record for Hart Park in the San Joaquin Valley, 17 IX 73.

69. *Mitoura nelsoni nelsoni* (Boisduval).

Distribution: GM. Flight: 6 VI to 17 VII.

70. *Mitoura siva* (Edwards).

Two subspecies occur in Kern County:

a. *Mitoura siva juniperaria* Comstock.

Distribution: SNM, Bodfish, PM, TJM. Flight: 3 IV to 30 VII.

b. *Mitoura siva mansfieldi* Tilden.

Distribution: TR. Flight: Late March to 17 IV.

71. *Incisalia augustus iroides* (Boisduval).

Distribution: MTNS. Flight: 19 III to 6 VI.

72. *Incisalia eryphon eryphon* (Boisduval).

Distribution: GM, PM. Flight: 11 VI to 9 VII.

73. *Strymon melinus pudica* (Hy. Edwards).

Distribution: Entire county. Flight: 3 III to 7 X.

74. *Brephidium exilis* (Boisduval).

Distribution: SJV, KRV, MD, MTNS (usually at low elevations). Flight: 27 II to 15 XI.

75. *Leptotes marina* (Reakirt).

Distribution: SJV, KRV, MD, MTNS. Flight: 3 IV to 3 X.

76. *Hemiargus ceraunus gyas* (Edwards).

This butterfly appears to periodically establish itself in the lower mountain canyons of the Tehachapi and Piute Mountains. It has been collected at Miracle Hot Springs in Kern Canyon, south of Bodfish in the Piute Mountains, 5-10 miles east of Caliente, 3 miles north of Twin Oaks and even in the San Joaquin Valley where a fresh female was collected along the Kern River at Hart Park, 23 IX 1982. Flight: 21 V to 23 IX.

77. *Hemiargus isola alce* (Edwards).

I collected a single fresh female near Buttonwillow in the San Joaquin Valley on 2 IX 80. Mesquite (*Prosopis*) still grows in a few places on the valley floor and out on the Mojave Desert and may support populations of this butterfly.

78. *Everes comyntas comyntas* (Godart).

This species may be a "resident" somewhere in the county but no populations are presently known. I found a small transient population along the Kern River at Hart Park (4 VIII 70) which was subsequently destroyed by flooding.

79. *Everes amyntula amyntula* (Boisduval).

Distribution: TM, Frazier Park. Flight: 18 III to 5 VII.

80. *Celastrina ladon echo* (Edwards).

Distribution: GM, PM, KRC, TM, TJM. Flight: 4 III to 14 VII.

81. *Euphilotes battoides* (Behr).

Two subspecies occur in Kern County:

a. *Euphilotes battoides bernardino* (Barnes & McDunnough).

Distribution: MTNS (including El Paso Mtns. and TR), WP, KV, JC. Flight: 26 V to 26 VII.

Eastern Kern County desert populations of *battoides* have been called *martini* (Mattoni) but are better viewed as atypical *bernardino*, according to John F. Emmel (pers. comm.).

b. *Euphilotes battoides comstocki* (Shields).

Distribution: Piute Mountain Vista, TM. Flight: 18 VII to 22 VII. Adults undoubtedly fly into the month of August.

Jim Brock recently discovered a large colony of *comstocki* on Piute Mountain Vista (or Lookout). Prior to his discovery this subspecies was known in California from only a few specimens collected in the Tehachapi Mountains (22 VII 18) by John A. Comstock. Adults are associated with a yellow flowered *Eriogonum*.

82. *Euphilotes enoptes* (Boisduval).

The taxonomic arrangement of this species in Kern County is very perplexing and open to considerable subjective opinion. Oakley Shields (1977) felt at that time the variable and atypical populations found in the southern Sierra, Piutes, Tehachapi and Mt. Pinos areas should best be viewed as forms of *E. enoptes enoptes*. Since Shields wrote his paper other populations have been discovered which do not appear to fit into this concept. My presentation of this species is tentative pending further study by other workers.

a. *Euphilotes enoptes enoptes* (Boisduval).

Distribution: MTNS. Flight: 24 IV to 26 VII.

b. *Euphilotes enoptes tildeni* (Langston).

Distribution: TR. Flight: Late August to early September. Jim Brock has one record for 27 III 77.

A large population exists on dry hillsides in the Temblor Range. Most records are from along Highway 58 near the Kern-San Luis Obispo County line.

c. *Euphilotes enoptes mojave* (Watson & Comstock).

Distribution: SNM (east and south slopes), MD, KV, JC. Flight: 9 IV to 26 V.

d. *Euphilotes enoptes* (Boisduval) ssp. Butterbredt Peak population.

Distribution: SNM (Butterbredt Peak and vicinity), PM (east slope), KV. Flight: Late April to early June.

This population is similar to *mojave* (which practically "surrounds" the Butterbredt Peak locality) but is much larger and is associated with *Eriogonum nudum* Dougl. ex Benth. which is used as the larval host (John F. Emmel, pers. comm.).

e. *Euphilotes enoptes* (Boisduval) ssp. Fall-flying population.

Distribution: Some of the same areas where *enoptes enoptes* flies in the spring. Hooper Hill, PM, KV, SNM, JC. Flight: 31 VIII to 9 X.

This *enoptes* is distinguished by bolder black spots on the ventral side and by darker suffusion of the forewings beneath. John Emmel reports that this same "subspecies" occurs on the north slopes of other southern California mountain ranges and in Inyo County.

83. *Euphilotes pallescens elvirae* (Mattoni).

Distribution: SNM (arid slopes), WP, PM (Harris Grade), Tehachapi. Flight: Mid-June to late September.

Shields (1977) notes that many specimens from Walker Pass resemble *pallescens* (Tilden & Downey).

84. *Philotiella speciosa speciosa* (Hy. Edwards).

Distribution: RRC, Randsburg and other locations in MD. No populations are presently known at Havilah (the type locality) or in the southern San Joaquin Valley of Kern County. Flight: Mid-April to 13 V.

85. *Glaucopsyche piasus piasus* (Boisduval).

Distribution: SNM, GM, PM, TJM, KV. Flight: 3 IV to 18 VI.

A huge population exists near Sageland in Kelso Valley where adults fly in desert washes (in association with a *Lupinus* spp.) out of the usual montane habitat.

86. *Glaucopsyche lygdamus* (Doubleday).

Three distinctive populations occur in Kern County:

a. *Glaucopsyche lygdamus australis* Grinnell.

Distribution: TM, TJM. Flight: 20 V to 14 VII.

b. *Glaucopsyche lygdamus columbia* (Skinner).

Distribution: SNM, GM. Flight: March to early May.

Langston (1969) has *columbia* extending the length of the Sierra Nevada; whereas, *incognitus* Tilden is restricted to the central Coast Ranges. Kern County *columbia* has larger black spots underneath than the more northerly populations of this subspecies.

c. *Glaucopsyche lygdamus* (Doubleday) ssp.

Distribution: KRC, PM, WP, KV. Flight: 12 III to 26 V.

This population is distinguished by bold black spots on both wings underneath and a smaller size than *columbia*. The females often have considerable blue scaling above and resemble *australis* in this respect. This "subspecies" appears to be intermediate between the two previously discussed subspecies.

87. *Lycaeides melissa paradoxa* (Chermock).

Distribution: TJM, TM, KRV, KV. Flight: 3 IV to 3 X.

88. *Plebejus saepiolus saepiolus* (Boisduval).

Distribution: SNM (Fay Creek), GM, PM. Flight: 19 VI to 11 VII.

Some Kern County material resembles southern California *hilda* (Grinnell & Grinnell).

89. *Plebulina emigdionis* (Grinnell).

Distribution: TJM including San Emigdio Canyon (the type locality), KRV including Weldon. Flight: 23 IV to 11 IX.

Emigdionis is very abundant on *Atriplex* at Weldon (Paul's Place).

90. *Icaricia icarioides evius* (Boisduval).

Distribution: MTNS, KV. Flight: 3 IV to 14 VII.

91. *Icaricia acmon acmon* (Westwood & Hewitson).

Distribution: Entire county. Flight: 21 III to 9 X.

92. *Icaricia lupini* (Boisduval).

Two subspecies occur in Kern County:

a. *Icaricia lupini monticola* (Clemence).

Distribution: MTNS, WP, KV, KRV. Flight: 10 IV to 14 VII.

b. *Icaricia lupini chlorina* (Skinner).

Distribution: TM, TJM. Flight: May to early July.

Populations of *chlorina* are very uncommon. Paul Opler found it in the hills west of Lebec (9 VI 57) associated with *Eriogonum nudum*.

93. *Icaricia neurona* (Skinner).

Distribution: SNM (Pacific Crest Trail 6–9 miles north of Weldon), KV (wash 1 mile south of Sageland), Erskine Creek nr. Lake Isabella, PM (1–2 miles south of Bodfish and on Hooper Hill), TM, TJM. Flight: 30 IV to 26 VIII. Possibly flies well into September in some years. In some areas two or more broods are indicated.

This blue is often locally abundant in the Piute Mountains just south of Bodfish where it frequents canyon bottoms and roadsides.

RIODINIDAE

94. *Apodemia mormo* (Felder & Felder).

Populations of this species vary considerably, and much confusion exists about the taxonomy of the species. Kern County populations are perplexing and await further study by a specialist. At least three distinct groups exist:

a. *Apodemia mormo* nr. *mormo* (Felder & Felder).

Distribution: El Paso Mountains, Homestead, Randsburg, JC. Flight: 18 IV to 13 V; 21 VIII to 9 X.

Fall flying specimens from Homestead and Jawbone Canyon closely resemble *deserti* Barnes & McDunnough. These populations fly in association with *Eriogonum inflatum* (Benth.) S. Stokes or with *Eriogonum heermannii* Dur. & Hilg. (Jim Brock, pers. comm.).

b. *Apodemia mormo* nr. *tuolumnensis* Opler & Powell.

Distribution: TR, SNM, KV, PM, TJM. Flight: 30 VII to 3 X.

Is associated with *Eriogonum wrightii* Torr. Locally common.

c. *Apodemia mormo virgulti* (Behr).

Distribution: SNM, KV, PM, WP. Flight: 13 IV to 26 V. Dark form: 27 VIII to 2 X.

Individuals associated with *Eriogonum fasciculatum* Benth. (Jim Brock, pers. comm.) which have a very dark phenotype are regularly encountered on Hooper Hill and in the Piute Mountains during late August and September. These represent a later brood of *virgulti*.

LIBYTHEIDAE

95. *Libytheana bachmanii larvata* (Strecker).

This is not a regular member of the county fauna. Several individuals of *bachmanii* were observed flying southward through Bakersfield in September and October of 1963. I captured one such individual on 6 X 63. Another specimen had been captured two years earlier in Bakersfield by Glenn Broadwater. No such migrations have been noted since 1963.

HELICONIIDAE

96. *Agraulis vanillae incarnata* (Riley).

Distribution: SJV, one record for Caliente. Flight: 13 IV to 3 XII.

NYMPHALIDAE

97. *Speyeria coronis hennei* (Gunder).

Distribution: TM, TJM. Flight: 6 VI to 28 VIII.

Hennei is often uncommon and hard to find. It prefers the high elevation cooler slopes of Mt. Pinos and Double Mountain and rarely descends to lower warmer elevations.

98. *Speyeria callippe macaria* (Edwards).

Distribution: MTNS. Flight: 14 V to 3 VIII.

Unsilvered *laurina* Wright occurs in all the Kern County populations so I consider it to be a "form" rather than a valid subspecies. I have one record of *macaria* from Bakersfield, 2 VI 62.

99. *Speyeria egleis tehachapina* (Comstock).

Distribution: Above 7000 feet elevation in TM, PM. Limited to summit peaks and ridges in TM. Flight: 30 VI to 24 VII. Records exist for August (Emmel & Emmel, 1973).

This endemic subspecies is found only in Kern County. On Double Mountain a forest fire consumed much of the summit area in 1979, but adults could still be found afterwards, perching on the blackened soil and rocks on the summit.

100. *Speyeria adiate atossa* (Edwards).

Distribution: TM, TJM. Flight: June to early September.

Some recent authors (Miller & Brown, 1981; Pyle, 1981) view the *adiaste* (Edwards) group to be subspecies of *Speyeria egleis* (Behr). However, *S. egleis tehachapina* and *S. adiate atossa* were once sympatric in the Tehachapi Mountains. This is strong evidence that the two are best viewed as distinct species.

Though numerous lepidopterists have visited colony sites and habitat regions of where *atossa* was once found, there are still no records of capture since 1959. It has probably become extinct because of drought or overgrazing (Emmel & Emmel, 1973; Howe, 1975).

101. *Speyeria hydaspes viridicornis* (Comstock).

Distribution: GM. Flight: 2 VI to 3 VIII.

102. *Clossiana epithore sierra* (Perkins).

Distribution: Tiger Flat Campground, GM. Flight: 24 VI to 11 VII.

This species still flies in the Greenhorn Mountains north of the Tulare County line but its status at Tiger Flat Campground is questionable. The author knows of no records for the past few years, and several visits to the colony site in June and early July (1981) failed to turn up a single specimen.

103. *Thessalia leanira* (Felder & Felder).

At least two distinct populations occur in the county:

a. *Thessalia leanira* nr. *wrightii* (Edwards).

Distribution: SNM (Pacific Crest Trail), GM (near Kernville), Erskine Creek nr. Lake Isabella, Bodfish, PM, Havilah. Flight: 24 IV to 19 VI.

This population is extremely variable. About 70% of the population near Bodfish is *wrightii*; 25% resemble *daviesi* (Wind) or nominate *leanira*; and the remaining 5% resemble the brick red desert subspecies, *cerrita*.

b. *Thessalia leanira cerrita* (Wright).

Distribution: RRC, WP. Flight: 1 IV to 21 V.

104. *Charidryas palla palla* (Boisduval).

Distribution: MTNS, KV. Flight: 1 V to 6 VII.

Palla is extremely variable from population to population even within the county boundaries. In the southern Sierra (Fay Creek 6 miles north of Weldon) and in Kelso Valley the *palla* pattern tends towards obsolescence and individuals may even resemble *C. neumoegei*. Populations to the west have progressively more heavily patterned individuals which little resemble the *palla* found to the east.

At Kelso Valley the ranges of *palla* and *neumoegeni* overlap. There appears to be no evidence of any intergradation taking place, however, as the *neumoegeni* population shows no tendency to assume *palla* characteristics, and the two species are allochronic in their occurrence. Thus, *neumoegeni* flies in desert washes in April and *palla* in those same desert washes in May. I have never found the two species on the wing at the same time, though only 4 or 5 days separate the flight periods of the two at this locality.

105. *Charidryas neumoegei neumoegei* (Skinner).

Distribution: MD, KV. Flight: 5 IV to 7 V.

106. *Charidryas gabbi* (Behr).

Distribution: TJM. Flight: Late May to June.

The status of this species is uncertain. *Gabbi* is frequently reported from the Frazier Park region, but many of these records are based on misidentifications of the heavily patterned *C. palla* which inhabits the area. However, I feel that at least some of these records are valid as *gabbi* is known to be present in nearby areas, and there is apparent contact between *palla* and *gabbi* at Frazier Park and on the north slope of Frazier Mountain. I collected a small series of *Charidryas* adults in this region (22 VI 79) which show startling mixed characteristics of the two species. John F. Emmel examined these specimens and concluded that there is obvious gene flow between the two entities in western Kern County. Further field work and study is needed.

107. *Phyciodes pratensis* (Behr).

Distribution: SNM, GM, KRV, Havilah, Miracle Hot Springs in KRC. Flight: 9 V to 8 IX.

Miller and Brown (1981) favor the use of *pratensis* over that of the more commonly used name, *campestris* (Behr).

The Kern County population of this species is atypical and may represent an undescribed subspecies. Most individuals tend towards *montana* (Behr), but specimens which approach nominate *pratensis* are not unusual (approx. 30–35% of the population).

108. *Phyciodes mylitta mylitta* (Edwards).

Distribution: KRV, MTNS. Flight: 15 III to 24 X.

A few records of strays exist for the southern San Joaquin Valley.

109. *Occidryas chalcedona chalcedona* (Doubleday).

Distribution: MTNS. Flight: 23 IV to 4 VII.

Material from the mountains of northeastern Kern County have enlarged light yellow spots and tend towards *olancha* Wright.

110. *Occidryas editha editha* (Boisduval).

Distribution: WP, SNM, GM (Cedar Creek), PM, KRC (rare). Flight: 20 IV to 8 VII. Tends to be very local.

111. *Polygonia satyrus satyrus* (Edwards).

Distribution: MTNS, KRV, SJV (Kern River at Hart Park; Poso Creek 8 miles north of Oildale). Flight: 17 III to 4 IX. One record for 19 I 76 at Richbar in KRC.

Very dark forms resembling *neomarsyas* dos Passos are frequently encountered in the early spring while the lighter *chrysoptera* Wright is found during the summer months.

112. *Polygonia zephyrus* (Edwards).

Distribution: PM, GM, Mt. Pinos. Flight: 12 IV to 17 VII.

Zephyrus tends to be local in occurrence and less common in Kern County than it is in the Sierra further north. It is usually found at higher elevations than *P. satyrus*.

113. *Nymphalis californica californica* (Boisduval).

Distribution: KRV, MTNS. Flight: 21 II to 11 VII; 4 X to 6 X.

This species periodically undergoes dramatic fluctuations in numbers. In 1972 and 1973 *N. californica* was very abundant. In the drought years 1977 and 1978 I saw none at all. It occasionally strays into the southern San Joaquin Valley with records from Bakersfield (27 V 52, 4 males leg. Allen Rubbert; 4 X 61; 14 V 72) and the Kern River at Hart Park (6 X 71).

114. *Nymphalis antiopa antiopa* (Linnaeus).

Distribution: KRV, SJV, MTNS. Flight: All months.

115. *Aglais milberti furcillata* (Say).

Distribution: KRV, MTNS. Flight: 20 II to 20 VII.

This species can be very common at times in the Piute, Greenhorn and Tehachapi mountain ranges. A few records also exist for the lowlands as it has been collected along the Kern River at Hart Park (31 III 72; 4 IV 72) and at Bakersfield (22 IV 51, 2 males leg. Allen Rubbert). Jim Brock found larvae at Hart Park on nettle (*Urtica holosericea* Nutt.) in 1972. These records only prove that *furcillata* sometimes strays to the Valley floor and establishes small transient populations. It is not found at these localities in the spring on a yearly basis.

116. *Vanessa virginiensis* (Drury).

Distribution: JC, SJV, KRV, MTNS. Flight: 12 II to 24 X.

117. *Vanessa cardui* (Linnaeus).

Distribution: Entire county. Flight: All months. Has been noted to overwinter on low foothills around Hart Park. It is sometimes extremely abundant during migrations.

118. *Vanessa annabella* (Field).

Distribution: Entire county. Flight: All months.

119. *Vanessa atalanta rubria* (Fruhstorfer).

Distribution: SJV, KRV, MTNS. Flight: All months.

120. *Junonia coenia* Hubner.

Distribution: Entire county. Flight: 20 II to 7 XI.

121. *Basilarchia lorquini lorquini* (Boisduval).

Distribution: SJV (Kern River at Hart Park; Poso Creek 8 miles north of Oildale), KRV, MTNS. Flight: 9 IV to 24 X.

122. *Adelpha bredowii californica* (Butler).

Distribution: KRV, MTNS. Flight: 12 IV to 3 XI.

SATYRIDAE

123. *Coenonympha californica californica* Westwood.

Distribution: KRV, MTNS. Flight: 25 II to 3 X.

I collected four specimens of this species along Poso Creek, 8 miles north of Oildale, on 4 V 81. These may represent an established population. The species is not generally found on the floor of the San Joaquin Valley.

124. *Cercyonis sthenele silvestris* (Edwards).

Distribution: MTNS, WP, KV. Flight: 28 V to 18 IX.

I follow the prevailing view of recent authors that *silvestris* is a subspecies of *sthenele* (Boisduval) and not *Cercyonis oetus* (Boisduval) as listed in Miller & Brown (1981).

DANAIDAE

125. *Danaus plexippus* (Linnaeus).

Distribution: Entire county. Flight: All months.

The Monarch overwinters in moderate numbers along the lower Kern River at Hart Park and Lake Ming. It also overwinters in the College Heights residential area of Bakersfield.

126. *Danaus gilippus strigosus* (Bates).

Distribution: SJV (rare), KRV, Havilah, Caliente region, KV, MD. One record for SNM (Fay Creek, 6 miles north of Weldon; 14 VI 80). Flight: 14 VI to 7 X. Jim Brock has one record for April.

Freezing temperatures in the winter may make it impossible for this butterfly to overwinter in the county. Apparently, migrants regularly reach the area in the spring and establish breeding populations at various favorable locations. These localities are usually in lower mountain canyons or valleys where the narrow-leaved milkweed *Asclepias fascicularis* Dene. in A. DC. is locally common along streams or drainage ditches. Freshly emerged adults (including one which was deformed and unable to fly) and mature larvae of *strigosus* have been found near or on this plant, suggesting that this is the primary larval foodplant for the region.

Prior to 1981 rare strays had been collected in the southern San Joaquin Valley. These records included the following: Hart Park (? IV 68 leg. Jim Brock; 25 VII 70; 18 VIII 70; 27 IX 70); Bakersfield (11 IX 60; 13 IX 63); 6 miles south of Greenfield adjacent to Hwy. 99 and Union Ave. (21 IX 79; 18 IX 81).

Considering the fact that this species has been so rarely collected in the Valley it came as quite a surprise to find a breeding population on the Tule Elk State Reserve on 20 VIII 81. I observed no fewer than ten different individuals of *strigosus* on that afternoon. Five were captured. Two additional specimens were collected at the same locality on 5 IX 81. *Asclepias fascicularis* was very common along the wash bottoms and swampy region where *strigosus* was encountered. No other *Asclepias* species was seen on the Reserve.

Doubtful or Questionable Records

Nastra julia (Freeman).

I collected a single specimen from an alfalfa field in Bakersfield during the summer of 1962 (no specific date). The specimen was tentatively identified by John F. Emmel. We know of no additional records.

Poanes zabulon (Boisduval & LeConte).

Emmel & Emmel (1973) reported that there is a "female of this species in the Na-

tional Museum of Natural History (USNM) collection with the label 'Havilah, Calif./ July/Barnes Collection.'" Like the Emmels, I doubt its authenticity.

Heraclides cresphontes (Cramer).

Though recent publications (Emmel & Emmel, 1973; Tyler, 1975) have suggested that *cresphontes* may have extended its range into Kern County and the Central Valley of California, we have no records for this species from Kern County. These statements have been made on the basis of larvae discovered in Fresno County. This infestation has since been eradicated.

Chalceria rubidus (Behr).

Emmel & Emmel (1973) report a possible record of this species from Monolith listed in the 1950 Field Season Summary. No populations of *rubidus* are known from this region today, and the record is considered doubtful.

Icaricia shasta (Edwards).

Emmel & Shields (1978(80)) report that there is a single male in the Los Angeles County Museum labelled "Tehachapi Mts., Kern Co., Calif." collected 22 VIII 37 by W. A. Evans. The record is doubtful since it has not been duplicated by others in this relatively well collected mountain range.

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Tule Elk Reserve is in the state park system; so, I am indebted to K. R. Morgan (the Area Manager) for providing the necessary collecting permit.

I would also like to thank all of the previously named individuals who directly or indirectly contributed data or information used in this paper. Dr. John M. Burns of the Smithsonian Institution clarified problems involving the genus *Erynnis*. Dr. William W. McGuire was consulted regarding the genus *Hesperia*.

Jim Brock was my co-worker on this project and has provided considerable information including foodplant records. He has also pointed out a number of taxonomic issues. Dr. John F. Emmel provided similar help through his numerous letters and helped clarify some of the taxonomic issues which were faced while writing this paper. Robert Langston first suggested I write and publish a Kern County checklist and provided considerable suggestions and encouragement which were most helpful. Not all of these suggestions from these contributors have been followed and the author takes full responsibility for any errors or criticisms of this paper. I would like to thank Dr. Emmel and Mr. Langston for reviewing this manuscript.

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BOOK REVIEW

BUTTERFLIES OF OMAN, by Torben Larsen. 1980. J. Bartholomew and Sons, Edinburgh. 80 pp., ill.

This book is part of a concerted effort by the Omani government to raise the consciousness and appreciation of that country's flora and fauna. It succeeds in its mission, both scientifically and artistically, the latter apparently largely through the efforts of Larsen's wife, Kiki.

It will surprise many that there is a significant butterfly fauna in this desert realm, but in fact, more species occur there than are found in the British Isles. Most of them occur in various *wadis*, around oases and in urban environments where the vegetation is relatively lush; many of the intervening arid areas are basically sterile. The Omani fauna is derived from three basic sources: the Palearctic, the Indian region, and arid eastern and southern Africa. Examples of each are given in the text. Whatever is known of the biology of all of the species is given, along with photographs of foodplants in many instances.

The nomenclature, though it will not please "traditionalists," is up-to-date and in conformity with that employed in the Palearctic literature. Thus, some "old friends" are in unfamiliar genera: *Stonehamia*, *Artogeia*, *Pontia*, *Epamera* and *Pseudophilotes* are used for species formerly placed in *Charaxes*, *Pieris*, *Pieris*, *Iolau* and *Philotes*, respectively. These generic changes, though, are based on solid biological and morphological studies, so their acceptance is made easier, even though there will be the inevitable complaints.

One aspect of the nomenclature that I do question involves two "species pairs" recognized in the book. One of these is *Zizeeria knysna* (Trimen) and *Z. karsandra* (Moore), usually considered conspecific. These two entities are both in Oman but at opposite ends of the country, apparently not sympatric at all, even in Oman. Since *Z. knysna* is an African entity, and *Z. karsandra* is Oriental, and both occur about where one would expect to find African and Asian faunal elements, their allopatric occurrence in Oman does not make a convincing case for their specific identities. The same objections can be made for the Asian *Papilio demoleus* and the African *P. demodocus*. In both instances, the African elements are known only from near Dhofur.

Despite such nit-picking criticisms as the above, I can recommend the book for anyone interested in the butterflies of this area, or even for the reader who is interested in what butterflies might be hardy enough to withstand the vicissitudes of such a climate. Mr. Larsen, perhaps our premier authority on Middle East butterflies, is to be congratulated on another fine book, though perhaps with less scientific "meat" than his earlier *Butterflies of Lebanon*.

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